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ABSTRACT

This document reviews the research on the use of the Myers-Briggs Type Indicator (MBTI), with medical students and physicians. The MBTI is a paper-and-pencil instrument based on C. G. Jung's theory of personality typology. The introductory section of the review describes the MBTI and explains its dimensions (extroverted versus introverted, sensing versus intuition, thinking versus feeling, and judging versus perceiving). The reliability and validity of the MBTI are discussed, and the extent of use of the MBTI is considered. Misunderstandings about the MBTI are explained and clarified. The main body of the review looks at applications of the MBTI in medicine. Studies reviewed are categorized according to the theme of statistically significant (p .05) findings. Themes addressed in the review underscore the relationship of the MBTI to: (1) medicine as a career and specialty; (2) educational and career guidance; (3) physician well-being and satisfaction; and (4) physician ordering of laboratory tests. Significant findings are critiqued in relation to the researchers' methodological approaches, and the review suggests that the methodology of many investigations could have been strengthened. One criticism made in the review is that many researchers have approached the MBTI dimensionally, rather than through analyses of the MBTI types. Directions for further research are suggested. (Author/NB)

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USE OF THE MYERS-BRIGGS TYPE INDICATOR (MBTI) WITH PHYSICIANS: A REVIEW OF THE LITERATURE

A Doctoral Research Paper

Presented to

the Faculty of the Rosemead School of Psychology

Biola University

In Partial Fulfillment

of the Requirements for the Degree

Doctor of Psychology

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by

David H. Howard

May 1992

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ABSTRACT

USE OF THE MYERS-BRIGGS TYPE INDICATOR (MBTI) WITH PHYSICIANS: A REVIEW OF THE LITERATURE

by

David H. Howard

Research on the use of the Myers-Briggs Type Indicator with physicians is reviewed. Studies are categorized according to the theme of statistically significant ($p < .05$) findings. Topics addressed underscore the relationship of the Myers-Briggs Type Indicator to: (a) Medicine as a Career and Specialty, (b) Educational and Career Guidance, (c) Physician Well-Being/Satisfaction, and (d) Test Ordering. The significant ($p < .05$) findings are critiqued in relation to the researchers' methodological approaches. While valuable information has been generated from the studies, the review suggests that the methodology of many investigations could have been strengthened. In what the reviewer considers to be conceptual confusion, many have approached the Myers-Briggs Type Indicator dimensionally, rather than through analyses of the MBTI types. Directions for further research are suggested.

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USE OF THE MYERS-BRIGGS TYPE INDICATOR WITH PHYSICIANS: A REVIEW OF THE LITERATURE

Introduction

The aim of this project was to examine and review the published research on the use of the Myers-Briggs Type Indicator (MBTI) with physicians. McCaulley (1978) produced a summary of the known and available data on the MBTI in relation to the health professions, including the seminal research done by Isabel Briggs Myers, The Myers Longitudinal Medical Study.

McCaulley's thorough work, which incorporated data gathered through 1973, was considered a starting point for the present paper. The comprehensive body of research used for the purposes of the paper therefore, are those articles published in 1973 and subsequently through 1991. Discussion of findings is limited to studies that are statistically significant ($p < .05$) and to those that pertain specifically to the MBTI and the medical profession.

Description of the MBTI

The Myers-Briggs Type Indicator (MBTI) is a paper and pencil instrument that is based on C.G. Jung's theory of personality typology (Jung, 1921, 1971). Developed by the mother-daughter team of Katherine C. Briggs and Isabel

Briggs Myers, the MBTI consists of 166 forced-choice, self-report items. An individual's score represents his or her preference in regard to (a) orientation toward life, (b) preferred mode of perception or learning, (c) preferred method of making judgments, and, (d) preferred orientation to the outer world. Individuals receive a letter score representing their preference on each of these dimensions (e.g., "E" for extroversion, and "S" for sensing, etc.) There is the possibility of 16 different personality types (four dimensions, each having one of two dichotomous scores).

Dimensions of the MBTI

What follows is a brief description of the typical or expected characteristics of each of the four dimensions. These descriptions are not exhaustive, nor are they meant to stand independently in describing an individual's overall personality. The types are more accurately understood when they are approached as a dynamic relationship between each of the four dimensions.

Extroverted (E) versus Introverted (I). When an individual is described as an extrovert it implies that his or her attention is directed towards people and objects. The introvert, on the other hand, focuses attention inward toward an environment of ideas. The extrovert tends toward action and trial-and-error, whereas the introvert is more reflective before acting.

Sensing (S) versus Intuition (N). The sensing individual's perceptions focus on the immediate experience of what exists as noted by the senses. Perceptions for the intuitive person focus on possibilities and relationships via the unconscious.

Thinking (T) versus Feeling (F). If a person's preference is toward thinking, his or her decision making is based on impersonal, cause and effect logic. The feeling individual incorporates subjective decision-making based on values.

Judging (J) versus Perceiving (P). Lastly, the judging person wants to order and control his or her world by planning and organizing, whereas the perceiving individual is more inclined to leave things open, and to live in a more spontaneous mode of adaptation to the world.

Reliability and Validity of the MBTI

A recent review of the MBTI research by Murray (1990) stated that the "reliability and validity of the inventory have been estimated and generally have been acceptable" (p. 1195). Murray found that the reliability of the instrument had been enhanced by improving the internal consistency indices. Myers and McCaulley (1985) also concluded that the psychometric qualities of the MBTI are acceptable, especially their findings regarding the internal consistency reliabilities. Writing of the various instruments used to

measure personality type empirically, Metzner (1979) concluded that the MBTI is more reliable and has had broader validation. Myers and McCaulley (1985) reported that test-retest reliabilities for the MBTI are shown to be consistent over time. They cited studies by Howes (1977) and Weiss (1980) indicating that if a change in type occurs, it will likely occur in only one dimension, and then only in a dimension where the preference is low.

In his review of the MBTI, Murray (1990) reported that there is sufficient evidence supporting the construct, content and predictive validities of the MBTI scales. Wiggins' (1989) review of the MBTI in the Tenth Mental Measurements Yearbook, stated that there is a "considerable body of evidence regarding the validity of the MBTI" (p. 538).

Extent of the Use of the MBTI

Myers and McCaulley (1985) have stated plainly their view that the dimensions measured by the MBTI are involved in practically every aspect of human experience. This implies the usefulness of the instrument in a wide range of testing situations. For instance, current uses of the instrument reported by Myers and McCaulley (1985) include education, counseling, career guidance, communication and cooperation/teamwork. Employing the MBTI with the purpose of helping individuals learn to appreciate each other's

differences appears as a common theme in each of these areas. Interpretation stresses the value of the individual learning about his or her own personality type and how this knowledge could help in choosing a profession or a field of study or in recognizing his or her specific gifts. Murray (1990) has mentioned that the MBTI is used as well by business organizations and churches. Some uses in business are related to decision-making, job turnover, organizational effectiveness and conflict-handling style. In summary, the MBTI has become an accepted measure of personality in non-psychiatric populations, such as in businesses, academic institutions and churches.

Misunderstandings about the MBTI: Types and Dimensions

Prior to reviewing any of the research in this project, one important facet of typology should be considered. There is a difference between the 16 letter types (ISTJ, ISFJ, INFJ, INTJ, ISTP, ISFP, INFP, INTP, ESTP, ESFP, ENFP, ENTP, ESTJ, ESFJ, ENFJ, and, ENTJ) and the four bipolar dimensions (e.g., introversion-extroversion) that are combined to make up each particular type. In this review, whenever the word dimension is used, or one of the bipolar adjectives without capitalization, it should be understood that it is one of the four dimensions to which reference is made and not one of the 16 letter types, which

are always referred to in capital letters, (e.g., INFJ). Some authors have discussed and evaluated types in terms of the individual bipolar dimensions, and, in some instances conclusions about types are being drawn based on findings regarding the individual dimensions. There are also instances where functions (sensing, intuition, thinking and feeling) are discussed separate from attitudes (extroversion or introversion). Briggs and McCaulley (1989) are clear when they stated that "the four-letter type formulas stand for a complex set of dynamic relationships between the functions" (p. 15). Other authors have referred to this dynamic relationship either directly (Wiggins, 1989) or indirectly in their discussion of the inferior function (von Franz, 1986) or the role of the unconscious attitude (Sharp, 1987; Whitmont, 1969). Some of the research discussed in this review disregarded this dynamic relationship.

As suggested by Sharp (1987), human experience is complicated, so that "any one function by itself is not sufficient for ordering our experience of ourselves or the world" (p. 14). Some investigators have assumed simplistically that because they have found a statistically significant relationship between one MBTI dimension and a particular dependent variable, that dimension's characteristics therefore can be attributed to all types that contain the dimension. Because the types are far more complex than this, it is necessary to address this

methodological and conceptual confusion wherever it appears throughout this review.

Applications of the MBTI in Medicine

This review now narrows to specific application of the MBTI in the field of medicine, beginning with the earliest research with medical students. Studies are thereafter traced through the year 1991.

Early Forms of MBTI Research

In the 1950's, Isabel Myers (1964) tested 5,355 students from 45 medical schools using an early form of the MBTI (Form C). Myers and Davis (1964), using the current form of the MBTI, conducted a 12 year follow up with 4,272 of these doctors and compared their results with scores from 3,503 high school students from Pennsylvania. They found that the medical school sample, compared to the high school group, contained 25% more introverts, intuitives and feelers, and over 16% more perceivers than would be expected. Myers and Davis reported that these differences were all significant ($p < .05$).

Myers and Davis (1964) also found a statistically significant relationship ($p < .002$) between type and students who resigned from, or failed in, medical school. The dropout rate for students with an EP & IJ preference was 3.1%, as opposed to a dropout rate of 5.0% for students with the opposite EJ & IP preference. The remaining analysis in this

study concerns the relationship between type and specialty selection. In 1973, Myers and McCaulley (1977) conducted another follow-up study on 4,953 of these physicians and found that 19% of them had changed specialties, and that their new specialty fitted theoretical expectations more accurately. Because McCaulley's subsequent work is more current (McCaulley, 1977, 1978), and according to her more theoretically congruent, discussion is limited to those relationships found to have achieved statistical significance.

McCaulley's (1977) study showed statistically significant relationships between MBTI type and those specialties represented by at least 75 physicians 12 years after the original study (Myers and McCaulley, 1977). The relationships, with their significances, are shown in Table 1. The ratios listed are selection ratios and indicate that the specialty is more attractive if the ratio is greater than 1.00 and less attractive if the ratio is less than 1.00.

The information reported was incorporated into a later work by McCaulley (1978) that also reported statistically significant differences and relationships between the original Myers sample of students and a sample of 1,881 physicians and 634 students assessed in the 1960s and 1970s. McCaulley reported that there were significantly more NJ and NF preferenced individuals and fewer SP preferenced

Table 1

Specialty Choices and MBTI Type

SPECIALTIES	RATIOS	SPECIALTIES	RATIOS
ISTJ		ISFJ	
Obstet.-Gyn.	1.59***	Anesthesiology	1.70*
		Ophthalmology	1.67*
		General Practice	1.30*
		Internal Medicine	.70*
		Psychiatry	.57*
		Cardiovascular	.29*
ISTP		ISFP	
Otolaryngology	1.95*	Anesthesiology	2.01***
Anesthesiology	1.85**	Urology	1.92*
Radiology	1.53*	Family Practice	1.81*
Psychiatry	.45**	General Practice	1.35*
Pathology	.36*	Psychiatry	.49*

(table continues)

(Table 1 continued)

SPECIALTIES	RATIOS	SPECIALTIES	RATIOS
INFJ		INTJ	
Internal Med.	1.46**	Child Psychiatry	2.20**
Anesthesiology	.27*	Pathology	1.94***
		Psychiatry	1.37*
		Internal Med.	1.36**
		Orthopedic Surg.	.42*
INFP		INTP	
Child Psychiatry	1.97**	Neurology	1.98**
Psychiatry	1.86***	Pathology	1.92***
Cardio. Dis.	1.70**	Psychiatry	1.66***
Otolaryngology	.00*	Obstet.-Gyn.	.37***
ESTP		ESFP	
Internal Med.	.75*	Obstet.-Gyn.	1.38*
Psychiatry	.41*	Internal Med.	.73*
		Psychiatry	.43**
		Pathology	.37*

(table continues)

(Table 1 continued)

SPECIALTIES	RATIOS	SPECIALTIES	RATIOS
ESTJ		**ESFJ**	
Obstet.-Gyn.	1.41**	Pediatrics	1.50**
General Practice	1.40***	Radiology	.45*
Internal Med.	.77*	Psychiatry	.29***
Psychiatry	.46***		
Child Psychiatry	.28*		
Neurology	.16*		
ENFP		**ENTP**	
Child Psych.	1.81*	Psychiatry	1.50**
Psychiatry	1.32*	General Practice	.71*
Anesthesiology	.51*		
Pathology	.47*		
ENFJ		**ENTJ**	
Thoracic Surg.	2.13*	Neurology	2.01*
Psychiatry	1.42*	Cardio. Dis.	1.58*
Orthoped. Surg.	.38*	Internal Med.	1.24*
		General Practice	.69*

(table continues)

(Table 1 continued)

Note. Table 1 adapted from Mary H. McCaulley, The Myers Longitudinal Medical Study, Center for Applications of Psychological Type. Gainesville, FL. 1977. Used with permission. *p <.05. **p <.01. ***p <.001.

individuals in her sample than in the original Myers sample. The NF's increased from 24% to 37%, the NJ's increased from 21% to 29% and the SP's decreased from 22% to 9%.

In a comparison of medical students with college students, McCaulley (1978) found that there were significantly fewer feeling preferenced females in medical school than would have been expected. This implies that females in medical school are more likely to favor the thinking dimension on the MBTI. This finding was supported in a study by Rezler and Buckley (1977). McCaulley (1978) also indicated that although all 16 types are found in a distribution of medical school students, there are significantly more students with introverted and intuitive preferences. Intuitives also chose independent study to a statistically significant degree.

In terms of the work setting, significantly more sensors were in roles placing them in contact directly with patients. Intuitors on the other hand were found more often in positions of administration, teaching and conducting medical research (all significant at the .01 level). Finally, sensors tended to work in less urban communities, whereas intuitors tended to work in communities that are more metropolitan.

The studies mentioned above are important for several reasons. First, they represent the initial research investigating MBTI type and its significance for physicians

and the medical community. Second, methodologically these works represent some of the most solid research on the MBTI with a medical population. Third, the studies incorporated large, national samples (i.e., samples of over 1000 persons) in longitudinal studies, allowing for greater generalizability than many of the later studies. Finally, many of the relationships presented deal with the 16 MBTI Types rather than with relationships between individual dimensions and another variable. This is not only a more theoretically congruent position, as noted above, it is also a more thorough and practical aid for medical students, medical administrators, educational and career counselors and other individuals interested in the MBTI's myriad relationships with physicians.

Even though the research conducted by Myers and Davis (1964) and McCaulley (1977, 1978) should have been followed more closely methodologically by later researchers, there are still some methodological styles that are worthy of mention. The comparison groups used were composed of high school or college students, or of a combination of these two groups. Because these students were likely in the middle of their years of identity formation where personality traits are in flux, they may not adequately represent the typical, adult population. This could affect the strength of the findings in terms of their generalizability. In addition, McCaulley's (1978) study appears to have been confounded by

adding an additional sample of physicians to the original sample of medical students.

Medicine as a Career and Specialty Selection

Rezler and Buckley (1977) tested the hypothesis that each of six health professions would attract women with distinctive personality characteristics. The study included 230 women from six different schools of health education at the University of Illinois Medical Center. Rezler and Buckley found a significant difference on the thinking-feeling scale between female medical students (n = 43) and students in the schools of occupational (n = 31) and physical (n = 35) therapy. Female medical students preferred dealing with situations in a logical and analytical manner (thinking) as opposed to the more value centered (feeling) approach preferred by the women in the other two schools. Again, Rezler and Buckley's study is limited by the author's analysis of the four bipolar dimensions as opposed to the Types, and generalizability is narrow in that the study's sample was confined to one school. Further research in the area of women's professional preferences and types could certainly be of value to career counselors and academic counselors in directing women toward a vocation that might prove to be rewarding for them.

Friedman and Slatt (1988) evaluated the MBTI results and post-graduate specialty choices of 521 students from the School of Medicine at the University of North Carolina,

Chapel Hill. The MBTI was administered to first year medical students entering the program from 1978 to 1981. The students were given the option of allowing their results to be used for research on career choice. Results showed that three of the four dimensions of the MBTI were statistically predictive of specialty choice. The dimensions were those of sensing-intuitive, thinking-feeling and judging-perceiving. The specialties which included students with distinctive MBTI dimensions were those of family medicine, obstetrics-gynecology and psychiatry. Those choosing family medicine tended to endorse sensing, feeling and judging dimensions; obstetrics-gynecology endorsed the sensing, thinking and judging dimensions; and those in psychiatry tended toward an intuitive, feeling and perceiving preference. As noted by the authors the statistical relationships found were only of moderate magnitude for all relationships. Also noted by Friedman and Slatt, generalizability of the findings to other settings was limited because the sample only included students from the University of North Carolina (Chapel Hill) School of Medicine. Finally, it is unclear why 119 out of the original 640 students were not included in the study. One could speculate that type had an influence on those students who allowed the investigators to use their MBTI results for research purposes. For example, Jung (1971) wrote about the Introverted Irrational Types as follows:

> The two types just described are almost inaccessible to judgement from the outside. Being introverted, and

> having in consequence little capacity or desire for expression, they offer but a frail handle in this respect...nothing is outwardly visible but reserve, secretiveness.(p. 403)

In future research, controls for the reactivity of the subjects is necessary if stronger conclusions are to be reached.

Levine, Barzansky, Blumberg, and Flaherty (1983) studied 30 senior medical students in an attempt to identify influences in their choosing of psychiatry as a specialty. Among the characteristics examined were the Sensing-Intuition dimension from the MBTI and several factors developed by the authors, i.e., a "U" factor which indicates an awareness of fantasy life and a concern for what makes people tick. The authors concluded from their data that individuals who were Sensing and had a low "U" factor (low awareness of fantasy and low concern for what makes people tick) tended to choose specialties other than psychiatry. There appear to have been several weaknesses with this study. Perhaps most noteworthy is the fact that the authors did not use a test of statistical significance to judge the strength of their conclusions. Also, subjects were low in number (N = 30) which limits enormously the ability to interpret the results. For example, there were only two Sensors and two Intuitors in the category noted as choosing psychiatry only, and no Sensors and only one Intuitor in the category of those undecided about psychiatry. There was only

a maximum of 7 subjects in any one category. The Subjects were also aware of their participation in a study of medical specialty, which could have had a negative effect on the results. Finally, "U" factor scores were based on a semi-structured interview performed by two different researchers who were not blind to the hypothesis under study. It is certain that more research connecting personality characteristics and specialty choice is needed, but the studies must more carefully control for internal and external validity. While the authors' anticipations appear valid and may have led them to the correct conclusions, their methodology was inadequate and inconclusive.

Quenck and Heffron (1975) studied the MBTI personality types of 91 family practice program directors and teachers and compared them to the personality types of 85 family practice residents. Quenck and Heffron found significant differences between the directors/teachers and their students. The residents tended to be more thinking and the teachers more feeling. The residents also tended to be more sensing than their predominantly intuitive teachers. And, when the dimensions referred to were analyzed in pairs, the strength of the relationship increased. The residents were found to be more predominantly sensing-thinking as opposed to their more intuitive-feeling teachers. The practical significance of these findings is that the "goals and values for some teachers and some residents, therefore, may be

quite different" (Quenck & Heffron, 1975, pp. 198-199). That teachers and students are different is validated by the fact that teachers are a group self-selected out of private practice. It would appear, therefore, that unequal populations were being compared and differences in the populations could stem from a large number of variables other than type, such as, age. The authors' findings demonstrate the need for greater understanding of MBTI types within the medical community. It would serve the teachers well to understand the differing perspective and needs of the students. Equipped with such understanding, teachers may provide medical residents information in ways that are more beneficial for private practice settings.

Harris and Ebbert (1985) conducted a study to test the hypothesis that personality characteristics of medical students choosing family practice had changed. They administered the MBTI to 55 residents at the University of Utah Family Practice Program and compared the results to the MBTI profiles of 20 private practice physicians, all of whom were practicing in rural areas of less than 10,000 people. Harris and Ebbert found that the private practice physicians were represented by a greater number of sensing than intuitive types. Also, the residents group had a greater number of intuitive and feeling than sensing or thinking types. What is unclear about the results is whether or not the differences between the residents and the practitioners

are significant or whether the significant differences are within group distinctions. Also, research incorporating samples that are homogeneous enough to compare would produce more beneficial results. The Harris and Ebbert (1985) study erred in comparing a general sample of residents with a specific group of physicians that had been drawn to the practice of rural medicine. The MBTI types of the group choosing a rural setting may have been sufficiently different from those of other family practitioners to have skewed the results. For example, West and O'Donnell (1982) found that students enrolled in a new curricula planned to prepare physicians for rural practice attracted more intuitive and feeling types than did a conventional curriculum. Also, the two groups of physicians in the two studies with rural care physicians appear to be opposite or contradictory in their dimensional profile. West and O'Donnell found a tendency toward intuitive and feeling types whereas Harris and Ebbert found a greater tendency toward sensing types. Clearly, further research is needed.

In the mid-1980's Taylor, Clark, and Sinclair (1990) tested a large (N = 778) nationwide sample of Family practice residents in order to ascertain the most frequent MBTI types among them. The results were then compared to several earlier studies in which numerous significant differences in the findings were established. In comparing family practice residents of the 1980s with general

practitioners of the 1950s, the authors found that a greater number of residents endorsed the dimensions of sensing (56% vs. 37%), thinking (54% vs. 39%) and perceiving (62% vs. 46%) in the 1950s group than in the investigators' research group. Compared to a group studied in 1973 by Quenck and Heffron (1975), the 1980s group had fewer sensing and thinking preferenced residents (37% vs. 71%, and 39% vs. 56%, respectively). In a comparison between a military sample and a civilian sample Taylor and associates found that the military comprised 19.4% more sensing-judging types than did the civilian sample. The finding that family practitioners in the Taylor et al. study predisposed toward intuitive-feeling was similar to findings in studies by McCaulley (1981), Harris and Ebbert (1985) and West and O'Donnell (1982). Other earlier studies (McCaulley, 1978; Quenck and Heffron, 1975) showed a majority of practitioners using their sensing-judging functions in family practice.

Educational and Career Guidance

Harris, Kelley, and Coleman (1984) performed a study on the stability of personality types to determine the usefulness of the MBTI as an aid to career guidance for medical students. Two freshman year classes (N = 125) at the University of Utah School of Medicine took the MBTI as part of their orientation. The test was retaken during the medical students' senior year. Time between testing dates ranged from 3 years to 3 years 8 months. The investigators

concluded that "no significant changes occurred on the MBTI scores from freshman test to senior retest" (p. 205). However, the investigators' definition of stability allows for change in the four bipolar dimensions of the MBTI for up to 35% of the tested population. It appears that Harris and associates were led to a redefinition after their finding that only 33% of the students had no change in their MBTI dimensions. Forty percent of the remaining students had changed in one dimension, 25% changed in two dimensions, and 2% changed in three. The results are misleading because the investigators implied that personality traits are stable, yet their definition of stability is so broad as to allow for excessive change. However, without an independent definition of change interpretation of stability becomes merely arbitrary.

O'Donnell (1982) investigated the relationship between MBTI scores and performance on the examination of the National Board of Medical Examiners. More specifically, O'Donnell focused on the pass rate as a function of the various combinations of the sensing-intuition and thinking-feeling scales. These scales measure the type of information a person attends to in the environment and how he or she characteristically reacts to and makes judgments about the material. O'Donnell found a significant proportion of NF students had a more difficult time passing the NBME exams than did subjects endorsing other types. Ironically, as

O'Donnell pointed out, it is NF students that are most attracted to the field of medicine and who generally perform well on the Medical College Admission Test. A strength of O'Donnell's study is his suggestion that construction of the examinations and curriculum should be explored further.

In an area more specific to educational guidance, West and O'Donnell (1982) investigated the influence of personality type on curriculum preference for rural medicine. Students (n = 25) choosing a conventional curriculum and those (n = 25) choosing a new, student-centered curriculum were given the MBTI upon admission to the University of New Mexico, School of Medicine. The authors found several statistically significant relationships between the various dimensions of the MBTI and curriculum preference. Those who selected the conventional curriculum scored higher on the introversion, sensing, and thinking scales. Students who preferred the new, student-centered curriculum scored higher on the extroversion, intuition and feeling scales.

A noteworthy concern of West and O'Donnell (1982) is that the new curriculum appears to be attracting students (extroverted, intuitive) who might grow tired of the routine inherent in the rural, primary-care practice for which it prepares them. The investigators noted that this curriculum is drawing students who like "adventure and new situations" (p. 96). These researchers seemed to have overlooked the

possibility that the students may not be anticipating the longterm effects of their choice but are simply choosing something new in the immediate, namely, the curriculum. The West and O'Donnell study does show that personality variables are likely to have an impact on education, when there is an opportunity for selection of curriculum, and indicates the need for further study in this area.

In conclusion, while research in this area does indicate that personality dimensions can impact curriculum preference and predict outcome on certain tests, the one study addressing type stability (Harris et al., 1984) is weak methodologically. Therefore, the evidence regarding curriculum and career is further complicated by the shorterm versus longterm implications of the dimensionally influenced personality preference.

Physician Well-Being and Satisfaction

In recent years the amount of research on the well-being of health care providers has increased. Lemkau, Purdy, Rafferty, and Rudisill (1988) assessed 67 family practice residents for burnout. The residency programs were all affiliated with Wright State University. All subjects completed the Maslach Burnout Inventory, the Millon Clinical Multiaxial Inventory, the Myers-Briggs Type Indicator, and two questions related to regrets about career decisions. The hypothesis of Lemkau and associates in respect to the MBTI, was that individuals scoring on the more extroverted,

intuitive, feeling, and perceptive end of these dimensions have fewer symptoms of burnout because they are better equipped to handle the interpersonal stresses of family practice.

In their analysis of the data, Lemkau and associates found several statistically significant relationships which confirmed their hypothesis. Those considered perceptive were less emotionally exhausted than judgers; feelers were less likely to report experiences of depersonalization than their thinking peers, and extroverts and intuitives had more of a sense of accomplishment than those rated as introverts and sensors. Significant relationships were also found indicating that career satisfaction was higher for the ENFP type. Intuitive, feeling and perceptive individuals were more satisfied with their overall choice of medicine as a career, while perceptive individuals in this sample were more gratified with having chosen family practice as a specialty.

While Lemkau et al. (1988) suggested that a particular personality type would experience less burnout and greater career satisfaction as a family practice resident, it should be noted that the analysis of the MBTI data in their study was performed by looking at the four bipolar dimensions individually. This eliminated the possibility of analysis of specific types. In that all 16 of the potential MBTI personality types were present among the investigators'

population, their findings may be the result of the many complex dynamics inherent in each of the types. They also noted that generalizability is limited because of the homogeneity of the groups in terms of sample characteristics (i.e., geographic location, likeness of setting, ethnicity and sex). Generalizability is also limited to other physician specialties.

Hughes, Mosier, and Hung (1981) examined the results of 33 family residents' MBTI scores and questionnaire results in a study of physician satisfaction, personality type and work setting. The MBTI was administered to residents at the St. Paul-Ramsey Medical Center between the years 1974 and 1978. The questionnaire was mailed to graduates of the program in 1979. The investigators indicated that through principal component factor analysis of the items on the questionnaire, two dimensions of satisfaction were achieved, one representing practice satisfaction and the other personal satisfaction. The difficulty with this claim, however, is that at least four subjects per score are needed for factor stability. Therefore, the sample (N = 33) was too small for a factor analysis having any stability. Hughes and associates reported that on the Personal Satisfaction factor three variables had high loadings: (a) family/social life, (b) time and energy, and (c) spouse happiness. On the Professional Satisfaction scale four variables had high

loadings: (a) effectiveness, (b) personal satisfaction, (c) professional satisfaction, and (d) training.

Significant statistical relationships indicated that introverts expressed a low level of Personal and Professional Satisfaction. On the Personal Satisfaction scale the rating was attributed to ranking of the family/social life variable specifically and to the effectiveness variable on the Professional Satisfaction scale. More specifically, this lack of satisfaction has to do with feeling ineffective practicing family medicine and feeling dissatisfied with family/social life. Theoretically there are several reasons why an introvert might appear to be less satisfied within the scope of this research. For instance, Myers (1980) described the introvert as one whose interests are drawn to the inner world of ideas, as opposed to the extrovert whose interests are drawn more toward the world of people and things, the outer world. Thus, one might expect an introvert practicing family medicine to grow tired of constant contact with people, both at work and with his or her family at home. One would also expect a low sense of effectiveness from the introvert because, as Jung (1921/1971) stated, introverts "often suffer from inferiority feelings" (p. 551).

Intuitives were found to express more satisfaction in regard to time and energy and spouse happiness, which appeared as significant on the Personal Satisfaction Scale.

Hughes et al. (1981) also found that intuitives took more vacation time than did their sensing peers. Thus, a likely hypothesis is that time off from work might provide the resident more time and energy to put into relationships with the family.

Perceptive types expressed greater satisfaction with the amount of time and energy their practices required of them than did judging types. However, other data from the Hughes et al. (1981) study indicates that the judging types worked a greater number of hours a day than did perceptive types. Further, perceptive types were found to feel greater satisfaction with their ability to practice effective family medicine. One last significant relationship was that of thinking types who were more likely than feeling types to put in a greater number of hours each day and throughout the week.

While Hughes et al. (1981) obtained some interesting findings in regard to physician satisfaction, generalizability of the results is tenuous at best. For instance, the MBTI was administered to some of the project population as long as 5 years prior to answering the questionnaire. The stability of the types over such a long period of time is uncertain. In one article discussed earlier (Harris, Kelly, & Coleman, 1984), the stablity of the MBTI for a 3 to 3 and 1/2 year interval revealed that less than 35% of the types had changed. However, 35% is a

large figure and leaves uncertain the stability of the types in the current article. Also, as in the Lemkau et al. (1988) study, Hughes et al. (1981) drew conclusions based on examination of the individual dimensions of the MBTI. Therefore, it should not be assumed that any type containing a particular dimension will hold all the characteristics of that dimension. For example, this study showed that thinkers put in more hours per day than did feelers. This does not mean that every type that contains the thinking dimension will work more hours per day than all types containing a feeling dimension.

In summary, further research should be conducted in order to examine the dynamics of each type in relation to burnout within family practice and in other specialty populations.

Physician Ordering of Laboratory Tests

Ornstein, Johnson, Market, and Afrin (1987) conducted an experiment to determine if physician personality had an effect on the amount of laboratory tests ordered. They compared the results of the MBTI dimensions with 39 physicians' rates of test ordering. The only significant finding ($p \leq .04$) was that introvert physicians ordered 20.2 percent more tests than did extrovert physicians.

Ornstein, Market, Johnson, Rust, and Afrin (1988) added the information of 14 additional physicians to the Ornstein et al. (1987) study and re-evaluated the combined results.

These investigators reported a significant statistical relationship, showing that intuitives ordered 20.5% more tests than sensors. However, the authors indicated that their finding is significant only at the 0.10 level. This is well above the traditional .05 level, let alone the .01 level of probability (Kazdin, p. 358, 1980).

In summary, Ornstein's (1988) re-evaluation of earlier research with a 35% increase in data nullified the original finding that introverts ordered more tests. Further, the second study showed a relationship between personality and test ordering that did not reach a statistically significant level.

Concluding Comments

This paper has surveyed the research on the use of the Myers-Briggs Type Indicator with medical students and physicians. Table 2 summarizes the research presented in this review corresponding to author, methodological weaknesses and adequacy of the studies.

Although this body of research has produced many innovative hypotheses, only a small amount of the data furnished has proved to be beneficial in guiding medical education and career choices. Sound and statistically significant relationships were found to exist between the MBTI and a small number of variables such as specialty choice. However, research in this field needs some

(Table 2)

The MBTI and Physicians: A Summary of the Research

Study	Methodological Weakness	Methodological Adequacy
Early Research		
Myers, et al. (1964)	Comparison Group	Adequate
McCaulley (1978)	Comparison Group	Adequate
McCaulley (1981)	Comparison Group	Adequate
Medicine as a Career and Specialty Selection		
Rezler, et al. (1977)	Small N (20-79) Dimension analysis Geographic limits	Limited
Friedman, et al. (1988)	Subject reactivity Dimension analysis Geographic limits	Limited
Levine, et al. (1983)	No statistical analysis Dimension analysis Low N (30) Subject reactivity Subjective ratings	Limited
Quenck, et al. (1975)	Compares unequal populations Dimension analysis	Limited
Harris, et al. (1985)	Compares unequal populations Dimension analysis	Limited
Taylor, et al. (1990)	Dimension analysis	Limited

(table continues)

(Table 2 continued)

Study	Methodological Weakness	Methodological Adequacy
Educational and Career Guidance		
Harris, et al. (1984)	No significant findings reported	Limited
O'Donnell (1982)	Geographic limits	Adequate
West, et al. (1982)	Small N (50) Geographic limits Dimension analysis	Limited
Physician Well-Being and Satisfaction		
Lemkau, et al. (1988)	Small N (67) Geographic limits Dimension analysis	Limited
Hughes, et al. (1981)	Small N (33) Geographic limits Dimension analysis Maturational effects Time of measurement	Limited
Physician Ordering of Laboratory Tests		
Ornstein, et al. (1987)	Small N (39) Dimension analysis	Limited
Ornstein, et al. (1988	Small N (53) Significance level (p.<.10) Dimension analysis	Limited

methodological improvement. Studies should incorporate larger population samples, allowing for inquiry into the preferences of the 16 MBTI types. This would deter researchers from projecting individual dimension characteristics and predilections inappropriately onto specific types. Also, because dimensions were analyzed separately, the same individual's type information could be used to signify several relationships. For example, in a population sample where introverts (I's) are significantly represented the same "I" (introvert) group could be used in all comparisons between "I"s and any other dimension, such as IN, IF and IJ. The potential for significant relationships is increased, yet the strength of generalizability of findings is confused and decreased. Finally, as in most research, the samples should be enlarged to national proportions, a strategy that would also strengthen the external validity of any findings.

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